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Nickel-catalyzed activation of amides and simple esters

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This presentation will focus on our recent efforts to develop reactions of acyl electrophiles using nickel catalysis. The methodologies proceed under mild reaction conditions and allow for the interconversion of amides and esters. These studies are expected to fuel the further use of non-precious metal catalysis for the construction of C–heteroatom and C–C bonds.

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Nickel-catalyzed asymmetric reductive cross-coupling between heteroaryl iodides and α-chloronitriles

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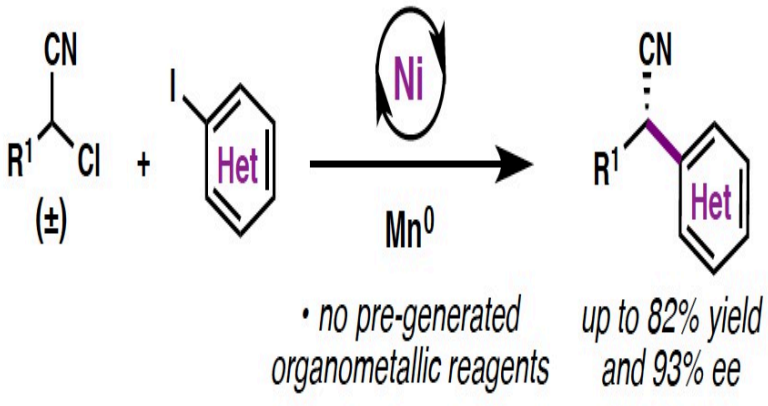
Ni-catalyzed asymmetric reductive cross-coupling provides an attractive and powerful means to access tertiary stereocenters. However these methods had previously been limited to benzylic alkyl partners and were not amenable to heterocyclic substrates. To expand the utility of this class of reactions, the Ni-catalyzed asymmetric cross-electrophile coupling of heteroaryl iodides and α-chloronitriles has been developed. This method furnishes enantioenriched α,α-disubstituted nitriles from simple organohalide building blocks. The reaction tolerates a variety of heterocyclic coupling partners, including pyridines, pyrimidines, quinolines, thiophenes, and piperidines under mild conditions enabled by a novel ligand scaffold. The products can be derivatized to a range of synthetically useful functionality.



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Review of biofuels and biofuels-related technology patents and patent applications